**EGG-citing Osmosis EGG-speriment - SBI 4U Unit: Homeostasis**

**Ministry EGG-spectations:**

**General**: E3. demonstrate an understanding of the anatomy and physiology of human body systems, and

explain the mechanisms that enable the body to maintain homeostasis.

**Specific**: E3.3 describe the homeostatic processes involved in maintaining water, ionic, thermal, and acid–base equilibrium, and explain how these processes help body systems respond to both a change in environment and the effects of medical treatments (e.g., the role of feedback mechanisms in water

balance or thermoregulation; how the buffering system of blood maintains the body’s pH balance; the effect of medical treatments on the endocrine system; the effects of chemotherapy on homeostasis)

**Introduction**: Osmosis is the diffusion of water across a semi-permeable membrane. A semi-permeable membrane is a barrier which only allows certain materials to cross. In the case of this demo, the material which is able to cross the membrane is water. Water travels through the membrane from an area of high solvent concentration to an area of low solvent concentration. Osmosis is important in maintaining the function and health of the cells. It allows for the maintenance of an internal steady state even when the environment around the cell is changing.

**Materials**:

* vinegar
* eggs
* corn syrup
* transportable containers

**Safety**: All materials can be handled safely without gloves or goggles and when finished can be put into the garbage. Wash hands thoroughly.

**Procedure**:

1. Place eggs in vinegar long enough before experiment that they have 48 hours for shell to dissolve off.
2. Once shell is dissolved, place eggs in containers filled with corn syrup at various amounts of time before the demo day in order to show the different stages of osmosis. Save 1-2 eggs to place in corn syrup during the in class demo.

**Results:** The eggs should shrivel up more and more the longer it is in the corn syrup.

**EGG-splanation:** Vinegar is an acid (acetic acid) and reacts with the calcium carbonate in the shell to form calcium acetate, water and CO2. This reaction dissolves the shell leaving only the membrane. Since there is a high concentration of solute and low concentration of solvent in the corn syrup, the water (solvent) flows out of the egg through the semi-permeable membrane into the corn syrup. This is because water diffuses from high to low concentration.

**Teacher Tips:** Be sure to prepare many eggs for the demo as they can burst quite easily. You could also perform this demo in class over a number of days in order to let the students view the eggs at every stage in the vinegar and in the corn syrup.

**References**: http://www.mysciencesite.com/Egg\_Osmosis\_Demo.pdf